

### Remarks

A Declaration under 37 CFR §1.132 is enclosed herewith. The declaration is by one of the inventors, Atsushi Yamamoto. The enclosed Declaration, due to time restraints, is not signed. It is the Applicants' intent to provide, in the near future, the enclosed Declaration signed by the Declarant.

The Declaration is associated with experimentation carried out on the presently claimed toothbrush to compare its effectiveness with the effectiveness of toothbrushes described in cited references. As shown in the reported results, superior effectiveness was shown with use of the claimed toothbrush.

In the present response, Claim 16, which is indicated as being allowable, is cancelled and new Claims 17-20 are added in order to present multiple dependent Claim 16 in independent form. It is believed that Claims 17-20 are now in condition for allowance. The allowance of Claims 17-20 is respectfully requested.

The present invention is a toothbrush having tufting holes formed in a tufting part which are elliptic or rectangular. A lengthwise direction of the tufting holes is along the direction the handle length, and the tufting holes are inclined, in directions perpendicular to lengthwise directions of the handle length, toward a tufting surface so as to have tufts implanted therein support one another.

Claims 1, 3, 6 and 8 are rejected under 35 USC §103(a) as

being unpatentable over Miller (U.S. Patent No. 2,004,633) in view of Monz (EP 0716573). Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Miller teaches a toothbrush having tufting holes inclined in directions perpendicular to the lengthwise direction of the handle, tufts (3,5) implanted in the inclined holes tilted towards the inside so as to support one another, and each pair of tufts that are inclined towards each other form a converging block. It is further alleged that Monz teaches a toothbrush having elliptical tufting holes extending in a lengthwise direction of the handle length.

It is respectfully submitted that Miller does not show implanted tufts supporting one another (by leaning against one another). The tufts (3,5) of Miller, as best viewed in Fig. 2, are inclined and leaning against tufts (4), not against each other. With such an arrangement, tufts (3,5) do not support one another, as defined in Claim 1.

In view of the above discussion, removal of this rejection is respectfully requested.

Claims 1, 3, 6 and 8 are rejected under 35 USC §103(a) as being unpatentable over Konczal (U.S. Patent No. 2,464,321) in view of Monz. Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Konczal teaches a toothbrush having tufting holes inclined in directions perpendicular to the lengthwise direction of the handle so as to have tufts (14) in the inclined holes tilted towards the inside to support one another, and each pair of tufts that are inclined towards each other form a converging block. It is further alleged that Monz teaches a toothbrush having elliptical tufting holes extending in a lengthwise direction of the handle length.

It is respectfully submitted that Konczal describes a brush for cleaning a dental plate, not a toothbrush. Specifically, Monz recites, at column 1, lines 5-8, that the "dental plate brush" is for brushing "the inner concave surfaces of dental plates which are more or less difficult to reach with brushes as ordinarily constructed for that purpose". Further, at col. 2, lines 28-29 of Konczal, it is described that cleaning takes place "by the oscillation of such brush within the plate". The only portion of the "dental plate brush" that is described as being for use in cleaning teeth, or cleaning between teeth, is the pointed portion (16), as described at col. 3, lines 15-21.

It is respectfully submitted that the teachings of Konczal do not describe or suggest a configuration for a toothbrush for cleaning tight spaces such as interdental spaces, tooth cervix occlusal surfaces of teeth, etc. The configurations of the subject to be cleaned by the present invention and the subject of the

invention of Konczal are completely different from each other and it is not obvious to apply the configuration of a brush having a particular purpose to another brush having a completely different purpose.

In view of the above discussion, removal of this rejection is respectfully requested.

Claims 1, 3, 6-9 are rejected under 35 USC §103(a) as being unpatentable over Crawford (U. S. Patent No. 2,040,245) in view of Monz. Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Crawford teaches a toothbrush having tufting holes inclined in directions perpendicular to the lengthwise direction of the handle, tufts in the inclined holes tilted towards the inside so as to have the tufts support one another, the inclined tufts worked into a V-shape, and each pair of tufts that are inclined towards each other form a converging block. It is further alleged that Monz teaches a toothbrush having elliptical tufting holes extending in a lengthwise direction of the handle length.

Even if the alleged teachings are found in the cited documents, there is no teaching or suggestion in Crawford to combine tufts supporting one another with tufts implanted in elliptical tufting holes, as discussed by Monz.

Also, there is no teaching or suggestion in Monz to combine tufts implanted in elliptical tufting holes with tufts supporting one another, as discussed by Crawford. As such, a person of ordinary skill in the art would not have found the Applicants' claimed invention obvious under 35 USC §103(a) based on Crawford and Monz, either singly or in combination.

There is thus no suggestion in either of the references that they should be combined with the other and one would not consider combining the two absent first a review of Applicants' specification.

It is respectfully submitted that the conditions for rejection under 35 USC §103a have not been met and that the present claimed invention is patentably distinct from the cited references. Removal of this rejection is respectfully requested.

Claims 1, 3, 4, 6, 8, 13 and 15 are rejected under 35 USC §103(a) as being unpatentable over Kaufman et al. (U.S. Patent No. 4,570,282) in view of Monz. Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Kaufman et al. teaches a toothbrush comprising tufting holes that are inclined in directions perpendicular to the lengthwise direction of the handle with tufts (30, 32) in the inclined holes tilted towards the inside, at an inclination of 10 degrees, so as to have the tufts support one

another, each pair of tufts that are inclined towards each other forming a converging block, the tufting holes accounting for 16-22 mm in a direction of the handle length, the width of the tufting holes being 8 mm or less, and the distance between the bases of the pairs of tufts being approximately 2.5 mm. It is further alleged that Monz teaches a toothbrush having elliptical tufting holes extending in a lengthwise direction of the handle length.

Even if the alleged teachings are found in the cited documents, there is no teaching or suggestion in Kaufman et al. to combine tufts supporting one another with tufts implanted in elliptical tufting holes, as discussed by Monz.

Also, there is no teaching or suggestion in Monz to combine tufts implanted in elliptical tufting holes with tufts supporting one another, as discussed by Kaufman et al. As such, a person of ordinary skill in the art would not have found the Applicants' claimed invention obvious under 35 USC §103(a) based on Kaufman et al. and Monz, either singly or in combination.

It is respectfully submitted that the conditions for rejection under 35 USC §103a have not been met and that the present claimed invention is patentably distinct from the cited references. Removal of this rejection is respectfully requested.

Claims 1, 3, 6-8 are rejected under 35 USC §103(a) as being unpatentable over Miller (U. S. Patent No. 2,004,633) in view of

Oishi et al. (U.S. Patent No. 5,799,353). Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Miller teaches a toothbrush having tufting holes inclined in directions perpendicular to the lengthwise direction of the handle, tufts in the inclined holes tilted towards the inside so as to have the tufts support one another, and each pair of tufts that are inclined towards each other forming a converging block. It is further alleged that Oishi et al. teaches a toothbrush with elliptical tufting holes, and tufts that are shaped in a V-formation (Fig. 2).

It is respectfully submitted that Miller does not discuss or suggest a toothbrush having tufts implanted into tufting holes which are inclined so as to have the tufts therein support one another. The configuration disclosed by Miller is discussed in detail above.

In view of the above discussion, removal of this rejection is respectfully requested.

Claims 1, 3, 6-8 are rejected under 35 USC §103(a) as being unpatentable over Konczal in view of Oishi et al. Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Konczal teaches a toothbrush having tufting holes inclined in directions perpendicular to the lengthwise direction of the handle having tufts tilted towards the inside so as to have the tufts support one another, and

each pair of tufts that are inclined towards each other form a converging block. It is further alleged that Oishi et al. teaches a toothbrush comprising elliptical tufting holes and tufts that are shaped in a V-formation.

It is respectfully submitted that Konczal does not disclose or suggest the claimed configuration for a toothbrush, as is discussed in detail above.

In view of the above discussion, removal of this rejection is respectfully requested.

Claims 1, 3, 6-9 are rejected under 35 USC §103(a) as being unpatentable over Crawford in view of Oishi et al. Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Crawford teaches a toothbrush having tufting holes inclined in directions perpendicular to the lengthwise direction of the handle with tufts in the inclined holes tilted towards the inside so as to have the tufts support one another, the inclined tufts worked into a V-shape, and each pair of tufts that are inclined towards each other forming a converging block. It is further alleged that Oishi et al. teaches a toothbrush with elliptical tufting holes.

Even if the alleged teachings are found in the cited documents, there is no teaching or suggestion in Kaufman et al. to



combine tufts supporting one another with tufts implanted in elliptical tufting holes, as discussed by Oishi.

Also, there is no teaching or suggestion in Oishi to combine tufts implanted in elliptical tufting holes with tufts supporting one another, as discussed by Kaufman et al. As such, a person of ordinary skill in the art would not have found the Applicants' claimed invention obvious under 35 USC §103(a) based Kaufman et al. and Oishi, either singly or in combination.

It is respectfully submitted that the conditions for rejection under 35 USC §103a have not been met and that the present claimed invention is patentably distinct from the cited references. Removal of this rejection is respectfully requested.

Claims 1, 3, 4, 6-8, 13 and 15 are rejected under 35 USC §103(a) as being unpatentable over Kaufman et al. in view of Oishi et al. Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Kaufman et al. teaches a toothbrush having tufting holes that are inclined in directions perpendicular to the lengthwise direction of the handle with tufts in the inclined holes tilted towards the inside, at an inclination of 10 degrees, so as to have the tufts support one another, each pair of tufts that are inclined towards each other forming a converging block, the tufting holes accounting for 16-22 mm in a

direction of the handle length, the tufting holes being 8mm or less in a direction of handle width, and the distance between the bases of the pairs of tufts being approximately 2.5 mm. It is further alleged that Oishi et al. teaches a toothbrush with elliptical tufting holes and tufts that are shaped in a V-formation.

It appears as though the alleged teachings are found in the cited documents. However, there is no teaching or suggestion in Kaufman et al. to combine tufts supporting one another with tufts implanted in elliptical tufting holes, as discussed by Oishi.

Also, there is no teaching or suggestion in Oishi to combine tufts implanted in elliptical tufting holes with tufts supporting one another, as discussed by Kaufman et al. As such, a person of ordinary skill in the art would not have found the Applicants' claimed invention obvious under 35 USC §103(a) based Kaufman et al. and Oishi, either singly or in combination.

It is respectfully submitted that the conditions for rejection under 35 USC §103a have not been met and that the present claimed invention is patentably distinct from the cited references. Removal of this rejection is respectfully requested.

Claims 5 and 14 are rejected under 35 USC §103(a) as being unpatentable over Miller in view of Curtis et al. (U. S. Patent No. 5,446,940) or Crawford in view of Curtis et al. or Konczal in view of Curtis et al. or Kaufman et al. in view of Curtis et al.

Claim 15 is rejected under 35 USC §103(a) as being unpatentable over Miller in view of Curtis et al. or Crawford in view of Curtis et al. or Konczal in view of Curtis et al. Reconsideration and removal of this rejection is respectfully requested.

It is alleged that Miller, Crawford, Konczal and Kaufman et al. teach all the essential elements of the claimed invention except tufting holes that are rectangular in shape, with short side dimensions of 0.8 to 2.0 mm and long side dimensions of 1.5 to 5.0 mm and a distance of 0.2 to 4.0 mm between converging blocks. It is further alleged that Curtis et al. discloses a distance at the base between the paired tufts to be about 1.65 mm, rectangular tufting holes that accommodate rectangular tufts, dimensions of the tufts being 1.193 mm on the shortest side, and 1.52 mm on the longest side, and the longest side of the tufting hole is in the lengthwise direction of the handle.

Deficiencies in the alleged disclosures of Miller and Konczal are discussed in detail above.

Even if the alleged teachings of Crawford, and Kaufman et al. and Curtis et al. are found in the cited documents, there is no teaching or suggestion in Crawford and Kaufman et al. to combine tufts supporting one another with tufts implanted in elliptical or rectangular tufting holes having the claimed dimension or configurations, as discussed by Curtis et al.

Also, there is no teaching or suggestion in Curtis et al. to combine tufts implanted in elliptical or rectangular tufting holes having the claimed dimensional configurations with tufts supporting one another, as discussed by Crawford and Kaufman et al. As such, a person of ordinary skill in the art would not have found the Applicants' claimed invention obvious under 35 USC §103(a) based on the cited references, either singly or in combination.

It is respectfully submitted that the conditions for rejection under 35 USC §103a have not been met and that the present claimed invention is patentably distinct from the cited references. Removal of this rejection is respectfully requested.

Claim 9 is rejected under 35 USC §103(a) as being unpatentable over Miller in view of Solanki et al. (U.S. Patent No. 6,314,605) or Konczal in view of Solanki et al. or Kaufman et al. in view of Solanki et al.

It is alleged in the Office Action that Miller, Konczal and Kaufman et al. teaches all the essential elements of the claimed invention except rows of converging blocks that are offset from each other. It is further alleged that Solanki et al. teaches a toothbrush with tufts offset from each other as shown in Fig. 4.

Deficiencies in the alleged disclosures of Miller and Konczal are discussed in detail above.

Even if the alleged teachings of Solanki et al. and Kaufman et al. and Curtis et al. are found in the cited documents, there is no teaching or suggestion in Kaufman et al. to combine tufts supporting one another with rows of converging blocks that are offset from each other as discussed by Solanki et al.

Also, there is no teaching or suggestion in Solanki to combine rows of converging blocks that are offset from each other with tufts supporting one another, as discussed by Kaufman et al. As such, a person of ordinary skill in the art would not have found the Applicants' claimed invention obvious under 35 USC §103(a) based on Kaufman et al. and Solanki et al. either singly or in combination.

It is respectfully submitted that the conditions for rejection under 35 USC §103a have not been met and that the present claimed invention is patentably distinct from the cited references. Removal of this rejection is respectfully requested.

Claims 10 and 11 are rejected under 35 USC §103(a) as being unpatentable over Miller in view of Chen et al. (U.S. Patent No. 5,590,438) or Crawford in view of Chen et al. or Konczal in view of Chen et al. or Kaufman et al. in view of Chen et al.

It is alleged in the Office Action that Miller, Crawford, Konczal and Kaufman et al. disclose all the essential elements of the claimed invention except the type of anchoring means used, and

that Chen et al. teaches a method of anchoring tufts by folding the tufts in half, placing them in a tufting cavity and driving an anchor into the tufting cavity to hold the tufts into the tufting cavity. It is further alleged that the anchor can be positioned numerous ways based on the tuft shape as shown in Figs. 6-11, such as one where the anchor is parallel to the short side of the tufting cavity as in Fig. 10.

Regarding Claim 11, it is respectfully submitted that Chen et al. does not show an anchor positioned  $\pm 10^\circ$  with respect to a center line along a lengthwise direction of a tufting hole as presently claimed. In Figure 10, which is referred to in the Office Action, the anchor (68) is shown as being perpendicular to a center line along a lengthwise direction of the tufting hole.

In view of the above discussion, removal of this rejection is respectfully requested.

Claim 12 is rejected under 35 USC §103(a) as being unpatentable over Miller in view of Chen et al. or Crawford in view of Chen et al. or Konczal in view of Chen et al. or Kaufman et al. in view of Chen et al. as applied to Claim 11 above and further in view of Solanki et al. Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Miller in view of Chen et al., Crawford in view of Chen et al., Konczal in view of Chen et

al. and Kaufman et al. in view of Chen et al. disclose all the essential elements of the claimed invention except tufts that are not lined up on one straight line in the lengthwise direction of the handle. It is further alleged that Solanki et al. teaches a toothbrush with tufts offset from each other as shown in Fig. 4, that are not lined up in a straight line in the lengthwise direction of the handle.

In view of Claim 12 depending from Claim 11, and the discussion above in regards to Claim 11, removal of this rejection is respectfully requested.

Claim 13 is rejected under 35 USC §103(a) as being unpatentable over Miller in view of Nicholas (U.S. Patent No. 4,706,322) or Crawford in view of Nicolas or Konczal in view of Nicolas. Reconsideration and removal of this rejection is respectfully requested.

It is alleged in the Office Action that Miller, Crawford, and Konczal teach the essential elements of the claimed invention except the exact size of the head of the toothbrush that is occupied by tuft holes. It is further alleged that Nicolas teaches a brush head that has a width of 12 mm and a length of 20 mm, and as shown in Fig. 1, the tufting holes account for a majority of the brush head and therefore account for 10-30 mm in direction of the handle length and 5-15 mm in the direction of the handle width.

Deficiencies in the alleged disclosures of Miller and Konczal are discussed in detail above.

Even if the alleged teachings of Crawford and Nicolas are found in the cited documents, there is no teaching or suggestion in Crawford to combine tufts supporting one another with tufting holes having the claimed dimensional configuration by Nicolas.

Also, there is no teaching or suggestion in Nicolas to combine tufts implanted in tufting holes having the claimed dimensional configurations with tufts supporting one another, as discussed by Crawford. As such, a person of ordinary skill in the art would not have found the Applicants' claimed invention obvious under 35 USC §103(a) based on Kaufman et al. and Solanki et al. either singly or in combination.

It is respectfully submitted that the conditions for rejection under 35 USC §103a have not been met and that the present claimed invention is patentably distinct from the cited references. Removal of this rejection is respectfully requested.

A document reprinted from the Journal of Clinical Dentistry, Volume X, Number 4, 1999 is included with this response. The document reports clinical studies of plaque removal efficacy. This Document reports the plaque removal efficacy, by a clinical experimentation, by using a new toothbrush, a V-shape toothbrush and a flat-head toothbrush as follows:

The new toothbrush corresponds to a toothbrush of the present



invention, wherein the tufting holes are rectangular, a lengthwise direction of the tufting holes is along the direction of handle length, toward a tufting surface so as to have tufts implanted therein support one another (see Figs. 2 and 3).

The V-shape toothbrush is a toothbrush, wherein tufts are implanted perpendicular to circular tufting holes and the end portion of the tufts is cut so as to form one chisel shape from two tufts.

The flat-head toothbrush is a toothbrush, wherein tufts are implanted perpendicular to circular tufting holes and the end portion of the tufts is so as to be flat shape.

The present clinical experimentation was performed against a total of 44 medically healthy subjects (16 females and 28 males) between 19 and 22 years of age, who had been recruited from among dental school students. All Ramfjord teeth or substitutions were present without crowns or large restorations (line 7 of the left column of page 128).

The format of the study design is presented in Figure 4. In this study, a single-blind (i.e. situation wherein the evaluator does not know the type of toothbrush used by each subject) crossover (i.e. all the toothbrushes to be compared are used in order to prevent the study from being unbalance) design was employed to compare the plaque removal efficacy of the new toothbrush to either the conventional V-shaped or the flat-headed toothbrush.

Accordingly subjects were divided into two groups, each consisting of 22 subjects (abstract of a paragraph commencing line 12 of the left column of page 128).

Subjects were asked to brush with their assigned toothbrush for 6 days using their normal brushing patterns (line 1 of the right column of page 128. The purpose was to make subjects used to the assigned toothbrush and to enable subjects to brush smoothly). On the seventh day, the plaque removal efficacy was clinically evaluated. To assess plaque removal efficacy, subjects were asked to refrain from any form of plaque removal or tooth cleaning after dinner, until the examination was performed. The plaque removal efficacy was evaluated by measuring plaque amount before and after brushing (line 12, right column of page 128).

As a result of the clinical study, it was confirmed that the new toothbrush corresponding to the present invention has a superior plaque removal efficacy than the other toothbrushes (i.e. V-shaped and flat-headed toothbrush) not only in "whole mouth" but also in "interproximal site" (Table I, Table II, Figure 5, Figure 6).

As shown clearly the toothbrush of the present invention is a necessary and effective method to achieve a high plaque removal efficacy.

As shown also by the attached Declaration of Atsushi Yamamoto the present claimed toothbrush provides exceptional and unobvious results when compared with prior art toothbrushes.

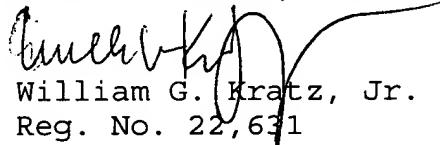
It is respectfully submitted that Claims 1, and 3-15, as well as Claims 17-20, which are indicated as being allowable, are now in condition for allowance. Allowance of Claims 1, 3-15, and 17-20 is respectfully requested.

If there are any issues of a minor nature remaining, the Examiner is urged to contact Applicants' attorney, the undersigned, at Area Code (202) 659-2930.

In the event that any fees are due in connection with this paper, please charge our Deposit Account No. 01-2340.

Respectfully submitted,

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